

# Monitoring Units

for efficient and precise monitoring of individual flows in circulating oil lubrication systems



## Application

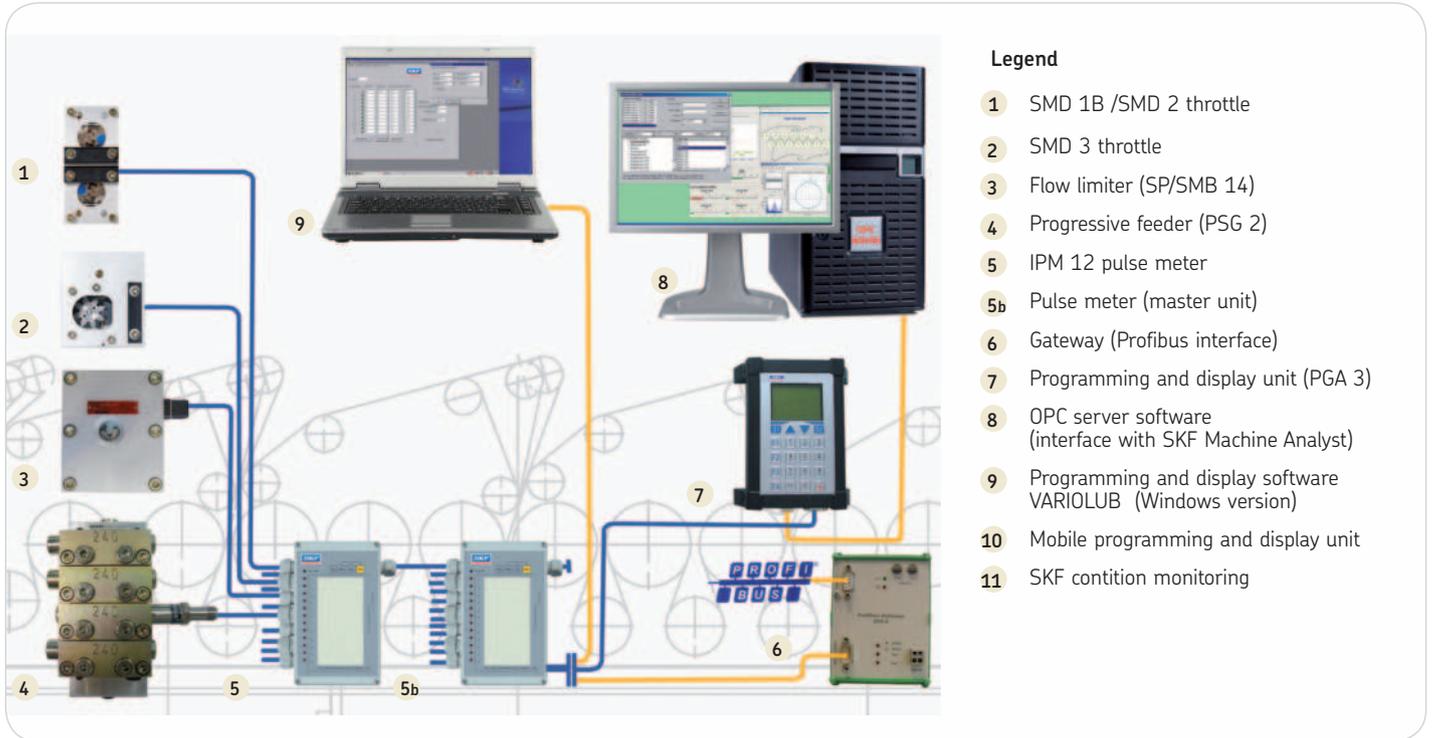
The VARIOLUB pulse monitoring system is used to monitor and evaluate incoming pulses (e.g. from gear-wheel type flow indicators or progressive feeders) from circulating oil lubrication systems. A constant comparison of actual incoming values with previously programmed limit values makes it possible to quickly detect faults. That helps to prevent machine outages.

A data link can be established with the process control level or a higher-ranking OPC server to meet the customer's requirements. Via an OPC server, it is also possible to link up with an SKF condition monitoring system. This applies equally to other condition monitoring systems

## Advantages

- Modular design, so the lubrication system can be adapted to machines and systems at any time.
- It is easy to assign a lube point or machine group to the monitoring unit since its compact design makes it possible to install it near the lube point.
- The pulse meters have 12 measuring inputs and can be connected to each other via RS 232 interfaces. The system is variable and can be expanded on demand.
- Expansions and reductions in the number of lube points or adjustments of the lubricant quantity can be realized without any problems.
- Monitoring near the lube points/assemblies is possible.
- Interfacing with all customary condition monitoring systems is possible.
- Standard interface for :
  - RS 232
  - Profibus DP
  - Field bus systems with NAMUR inputs conforming to DIN 19234
  - Ethernet-OPC link

**Example: layout of a pulse monitoring system for circulating-oil lubrication systems, optionally with flow limiters, throttles and progressive feeders**



**Legend**

- 1 SMD 1B /SMD 2 throttle
- 2 SMD 3 throttle
- 3 Flow limiter (SP/SMB 14)
- 4 Progressive feeder (PSG 2)
- 5 IPM 12 pulse meter
- 5b Pulse meter (master unit)
- 6 Gateway (Profibus interface)
- 7 Programming and display unit (PGA 3)
- 8 OPC server software (interface with SKF Machine Analyst)
- 9 Programming and display software VARIOLUB (Windows version)
- 10 Mobile programming and display unit
- 11 SKF contition monitoring

**Function description**

Individual lubricant distributors like throttles, flow limiters or progressive feeders are watched over by the IPM 12 pulse meter. Each pulse meter (IPM 12) can monitor as many as 12 lube points, each lube point being assigned to one input on the IPM 12. Individual lube points are additionally monitored by LEDs in the event of malfunctions and alarms. Moreover, fault and alarm signals are passed on to the process control level groupwise in the form of relay contacts. A major advantage is the small amount of wiring and installation work involved since individual IPM 12s can be connected to each other in groups.

The display of the PGA 3 programming and display unit, a stationary unit like the IPM 12, shows the volumetric flows in liters per minute or, optionally, in pulses per minute. The PGA 3 is also used to program specified values as well as calibration and alarm-threshold values. Grouping, which consists of multiple slave IPM 12s and one master IPM 12, is also possible. With an OPC interface (Ethernet), it is possible to integrate all the actual and specified values into any arbitrary process system.

So interfacing with an existing or newly installed Condition Monitoring System (COMO) is no problem.

The PGA 3 mobile unit comes with the same features and assures mobile use on the spot. As an option, it is possible to use the VARIOLUB software program instead of PGA 3 units. It is used to read out and program the data. It is also possible to establish a Profibus interface with the process control level via a gateway available from SKF.

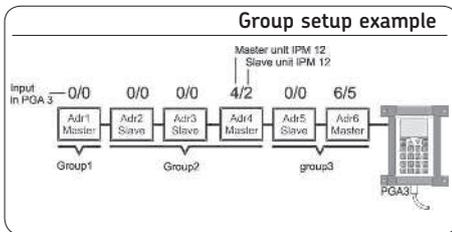


## Monitoring Units

### IPM 12

The job of the IPM 12 pulse meter is to monitor the functionality of upstream lubricant distributors, and thus the lube points supplied by the same: It is possible to assign as many as 12 lube points to one pulse meter. The specified, set points, calibration and alarm-threshold values entered via a programming unit/programming software are compared with the respective actual values at fixed, specified intervals. A visual/electrical alarm or fault signal is emitted in the event of deviations. An IPM 12 has two equivalent RS 232 interfaces which can optionally be used as inputs or outputs. So multiple IPM 12 units can be connected in series.

The units are divided into slaves and a master unit to be defined. So it's possible to define multiple groups in one chain.



The master and slave units are assigned with the PGA 3 as follows in the case of the above example:

1st input: master: address 6  
 slave: address 5  
 2nd input: master: address 4  
 slave: address 2

The lowest address of the consolidated slaves (address 2 in the example above) is entered. The software uses that to calculate the total number of slaves between the first slaves and the master (above example: 2 slaves, address 2 and address 3).



### PGA 3 programming and display unit

The PGA 3 reads the measured specified/actual values from the selected pulse meter. The digital display of the measured values is in "pulses per minute" or, optionally, in "liters per minute". The PGA 3 is also used to program the actual, specified, calibration and alarm-threshold values and to enter groups of masters and slaves (IPM 12).

The measuring results from the respectively selected IPM 12 pulse meter are read out via the RS 232 serial interface. With an OPC interface (Ethernet) it is possible to pass the data on to the process control level via a downstream OPC server.

So interfacing with an existing or newly installed Condition Monitoring System (COMO) is no problem.

### Mobile programming and display unit, the PGA 3 Mobile

The mobile display unit, the PGA 3 Mobil, is identical with the stationary PGA 3 in terms of its design and functions.



### Profibus interface

The IMP 12 pulse meters are integrated into the process control system with Profibus DP via an intelligent gateway. The gateway translates the data of the internal serial interface 1:1 for the Profibus DP. The data are evaluated at the process control level.

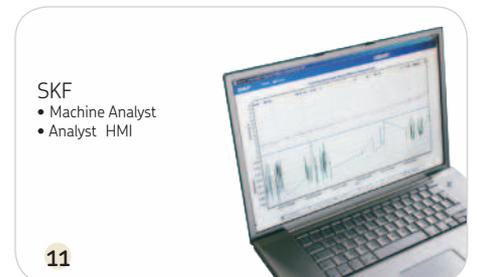
The individual IPM 12 pulse meters have freely settable addresses; the gateway, for its part, has a Profibus address. The individual IPM 12 units can be read out on a cyclic basis via the process level and gateway. With a gateway, it is possible to read out multiple IPM 12 units provided they are looped through each other at the RS232 level.

### PC/Laptop

With SKF VARIOLUB software, all the system settings like flow quantities and specified values of the respectively activated IPM 12 can be displayed and programmed on a user-friendly basis

### Inventory monitoring

As an optional feature, it is possible for the data from the PGA 3 to the OPC server to be transmitted to the SKF inventory monitoring program, Machine Analyst /Analyst HMI. So a customer-specific data selection, displayed and evaluated in graphs, is possible with little trouble.



SKF  
 • Machine Analyst  
 • Analyst HMI

**Order No. 1-3022-EN**

Subject to change without notice! (07/2014)

**Important product usage information**

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

**Brochures and printed material**

**Operating instructions**

SMD 1B/SMD 2/SMD 3 VARIOLUB lubrication system

Operating instructions for VARIOLUB (with hand-held display and PGA 2)

Operating instructions for VARIOLUB (with PGA 3)

951-130-300-EN

DSB 6-015-09-EN

951-130-310-EN

**Brochures**

SKF Machine Analyst

SKF Machine Analyst / HMI

**SKF Lubrication Systems Germany GmbH**

2. Industriestrasse 4 · 68766 Hockenheim · Germany

Tél. +49 (0)62 05 27-0 · Fax +49 (0)62 05 27-101

[www.skf.com/lubrication](http://www.skf.com/lubrication)

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